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**STRATEGIC SEALIFT; DID DESERT STORM BELIE THE CRITICISMS?**

**BY**

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## **ABSTRACT**

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The Ready Reserve was not prepared. The Fast Sealift Ships inventory was insufficient. Commercial shipping in the United States was not the prominent industry it had been in years past. Lift requirements would not have been met without chartering both U.S. and foreign flagged vessels. Given the preponderance of criticism it is worth asking if it was justified, were any lessons learned from it, and if so, is the United States Navy on the right track to correct the problems and set up structures that will prevent them from reoccurring.



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There was no shortage of controversy about strategic sealift during the post-Operation Desert Shield/Desert Storm evaluations. The Ready Reserve Force was not prepared. The Fast Sealift Ships inventory was insufficient. Commercial shipping in the United States was not the prominent industry it had been in years past. Lift requirements would not have been met without chartering both U.S. and foreign flagged vessels. Given the preponderance of criticism it is worth asking if it was justified, were any lessons learned from it, and if so, is the United States Navy on the right track to correct the problems and set up structures that will prevent them from reoccurring.

Any discussion of sealift must begin with a discussion of common terminology. The generic term sealift is used to denote a bewildering array of ship types and capabilities. Dry Cargo refers to any non-containerized cargo, such as parts, ammunition, and stores. Two subsets of Dry Cargo are break bulk and roll on/roll off. Roll on/roll off refers to any wheeled cargo - vehicles. Break Bulk cargo must be craned aboard, either by shore-based or self-contained cranes.

There are three major classes of ships used for strategic sealift. The first is the Fast Sealift Ship (FSS), able to maintain a maximum sustained speed of thirty knots. The ship's range is 12,200 nautical miles with a cargo capacity of 185,000 square feet. The FSS features twin cranes, a helicopter handling and storage area, roll on/roll off capability, along with the

ability to carry bulk equipment, e.g., tanks and armored vehicles. The next type of sealift is the Large Medium Speed Roll on/Roll off (LMSR) vessel. As the name implies this ship has roll on/roll off capability, a helicopter landing area, twin cranes, and stern and side port ramps for on loading/off loading. Maximum sustained speed is twenty-four knots, for a range of 12,000 nautical miles but most importantly it has a 333,000 square foot cargo capacity. The last type of sealift is the dry cargo vessel, which can be either Roll on/Roll off (RO/RO) or Break Bulk. Their speed and size limit these ship's usefulness. They can maintain 19.6 knots for a range of 11,100 nautical miles. Their cargo capacity is limited to 140,000 square feet.

Strategic sealift is a panoply of programs. The Maritime Administration (MARAD) is an organization within the Department of Transportation responsible, among other things, for the maintenance and upkeep of the ships in the National Defense Reserve Force (NDRF). MARAD has day-to-day control while the ships are in a reduced operational status. Once activated, the ships come under the operational control of the Department of the Navy's Military Sealift Command (MSC). The NDRF consists of two groups of ships, the Ready Reserve Force (RRF) and an array of World War II sealift vessels. Prior to 1990 approximately 7.4 billion dollars had been invested in a ten-year modernization program of the RRF.<sup>1</sup> This equated to 83 dry cargo ships (17 roll on/roll off), 11 tankers, 2 troop ships, 25 afloat prepositioning ships, 8 fast sealift ships, 2 aviation logistics ships, and 2

hospital ships. The oldest part of the NDRF was the 116 additional ships ranging in age from twenty to forty-five years old including seventy-one World War II-era Victory ships.<sup>2</sup> The only sealift program not administered by MARAD was the Sealift Readiness Program (SRP). It was administered by the Department of the Navy through the Military Sealift Command. This program required shipping companies bidding on MSC contracts or receiving government subsidies to commit fifty percent of their cargo capacity to the Department of Defense for possible use during less than full mobilization, contingencies, or emergencies. There were 132 vessels in the program: thirty-three tankers and ninety-nine dry cargo vessels. Execution of the SRP required the authorization of both the Secretary of Defense and the Secretary of Transportation. Authorization was contingent upon NDRF ships not available in sufficient time or number to meet the lift requirements of the operation; and, there was insufficient shipping capacity at a fair and reasonable price or if available, could not meet lift requirements. If both these criteria were met then MARAD must report to Congress SRP activation's impact on commercial industry.<sup>3</sup>

#### **CRITICISMS**

If one single agency should receive the lion's share of criticism it would be MARAD. MARAD's tasking was to maintain and upkeep the RRF and ensure the ability to activate the ships

according to published timelines. Only one third of the RRF had been tested prior to Operation Desert Shield/Desert Storm. The majority of delays in activating the RRF were due to propulsion and/or auxiliary machinery casualties. Additionally, shipping companies contracted by MARAD to prepare the ships lacked the technical expertise and resources to fulfill their contract. During the early days of Operation Desert Shield/Desert Storm MARAD canceled these contracts and contracted with shipping companies better able to meet the requirements.<sup>4</sup>

The first line of surge sealift capability, RRF, was heavily criticized despite some success in meeting mission requirements. RRF readiness status was determined by the number of days necessary to activate specific vessels. Sixty-five vessels were in a 5-day activation status, 28 vessels in a 10-day status, and 3 vessels in a 20-day status. Actual activation was much slower: 5-day scheduled breakout took 11 days and 10-day breakout took 16 days. Only twenty of the sixty-two ships were activated within published timelines. Another criticism was that the RRF ship mix did not reflect current requirements. MARAD had predicted that the fleet would continue to decline "from 168 militarily useful dry cargo ships in 1990 to thirty-five by the year 2005."<sup>5</sup> Too many of its eighty-three dry cargo ships were break bulk. Current DOD force structure had evolved to favor Roll on/Roll off (RO/RO) vessels, of which there were only seventeen. The most desirable RO/RO vessels were the crane-equipped, container-compatible Fast Sealift Ships. Although only eight in number,

their affect was significant: "Given the increasing need for our Armed Forces to project themselves rapidly into theater - perhaps without any military infrastructure - we must ensure that we can move our troops and equipment across the oceans. The fast sealift ships that were available to us in the Gulf did a remarkable job."<sup>6</sup>

Fortunately, the remainder of the vessels in the NDRF did not have to be activated. These ships were too old, too small, slow, and antiquated. These ships were smaller-sized, slower-loading, with slower transit times, and the antiquated propulsion systems posed two problems; the plant age made sustained reliability problematical at best and made recruitment of qualified engineers extremely challenging.<sup>7</sup>

Established in the mid-1970s, the SRP failed to evolve with industry and force requirements. Operation Desert Shield/Desert Storm required large numbers of large, fast ships and the vessels in the SRP were predominantly small and slow. This led to a significant lift shortfall. A structural problem was the unrealistic reliance on break bulk ships. In the meantime, force structure required a different class of ship - RO/RO. The SRP process and congressional reporting requirements had become too unwieldy and, in fact, if the SRP had been executed there was a belief that the U.S. commercial shipping industry would be permanently damaged since the ships would be taken out of the commercial liner service.<sup>8</sup> MSC did not execute the SRP "principally because the program did not adequately provide the

necessary services and vessels."<sup>9</sup> If there is a common thread linking the sealift programs it is the failure to continuously monitor and adjust to changing circumstances.

#### **SUCCESS AMONGST THE PROBLEMS**

Though they failed to meet the activation guidelines, MARAD achieved a higher rate than any knowledgeable observer expected despite having only one third of what they requested in their annual budget in 1990.<sup>10</sup> MARAD activated seventy-six out of ninety-six vessels in the RRF including all seventeen RO/RO ships. Contractors unable to comply with activation provisions were released and new contractors able to meet the provisions were hired. After changing their contractors, MARAD had a 93.5 percent reliability rate of activation.<sup>11</sup>

Like the agency that maintained them before Operation Desert Shield/Desert Storm, the RRF fell short of meeting its lift targets but they still managed impressive lift figures. Ninety-five percent of the cargo required for Operation Desert Shield/Desert Storm was moved by sealift. Here is a breakdown of cargo moved by the RRF and other ships under MSC control:

- (1) Fast Sealift Ships transported 4.5 million square feet of cargo.
- (2) The Afloat Prepositioning Ships carried 1.6 million feet of cargo.

(3) The Maritime Prepositioning Ships moved 3.5 million square feet of cargo.

(4) The RRF moved over 8.9 million square feet of cargo.<sup>12</sup>

The criticisms of the World War II ships in the NDRF were valid. Even in the event of Presidential Activation, the probability that these ships would have been productive was low.

There is a need for a program like SRP. The U.S. flag companies were willing to support Operation Desert Storm/Desert Shield; however, the industry had limited numbers of RO/RO and break bulk vessels. Sixty-two ships from various companies were volunteered and utilized to support cargo moves. However, there were no guarantees U.S. shipping companies would lend their support to future contingencies.<sup>13</sup>

Although sealift performed beyond pre-Operation Desert Shield/Desert Storm expectations, the post-war criticism of specific programs was largely warranted. There were not enough ships in the RRF; the NDRF inventory was antiquated. MARAD had the wrong ship mix to meet force requirements: specifically, not enough RO/ROs and Fast Sealift Ships. The RRF had not been properly maintained and activation exercises were not performed. Ships were berthed too far from activation ports. The SRP was too unwieldy and costly and the commercial shipping industry did not have the ship mix to meet the mission.

## **LESSONS LEARNED**

Determined to learn from failure as well as success, MARAD and MSC studied the lessons from Operation Desert Shield/Desert Storm. MSC looked at specific actions to strengthen and modernize the military sealift force through new ship construction and upgrading the RRF.<sup>14</sup> The procurement of twenty-one RO/ROs between fiscal years 1992 – 1995 and scrapping the World War II era ships in the NDRF saved ten million dollars in maintenance over ten years.<sup>15</sup> MARAD took specific actions in response to lessons learned:

- (1) More RRF vessels were berthed closer to their likely embarkation ports.
- (2) The activation schedule for RO/RO ships was changed from five to four days.
- (3) During peacetime, ships in a high readiness status were assigned skeleton crews to perform maintenance and periodically activate the ships to test readiness. Recent readiness exercises demonstrated these ships now meet the four-day activation timeline.<sup>16</sup>
- (4) The commitment of MARAD was evident when the Deputy Administrator for MARAD stated "MARAD would award RRF management contracts only to firms that can prove their capabilities."<sup>17</sup>

The embarrassing nature of the lessons learned failures were addressed by United States Transportation Command, the General

Accounting Office, and other organizations which spurred the Department of Defense to conduct the Mobility Requirements Study.

### STUDIES

In 1992, the Department of Defense chartered the Mobility Requirements Study (MRS). Their mandate was to review the lessons learned from Operation Desert Shield/Desert Storm and the post-Cold War strategic environment and issue a strategic mobility plan. This plan was to provide the basis for ensuring the right mix of strategic lift assets would be available for the future defense transportation system. The study was released on January 23<sup>rd</sup> 1992.

The MRS recommendations targeted specific sealift program shortfalls. The first recommendation was to increase surge sealift capacity to 380,000 square feet, which required procuring nineteen large, medium-speed RO/RO vessels (LMSR). The other major sealift recommendation was to expand the RRF from 92 to 101 dry cargo ships while emphasizing readiness. Both recommendations were implemented.

In 1995, the Mobility Requirements Study Bottom Up Review (MRS BURU) was chartered by then-Secretary of Defense Les Aspin. Its mandate was to validate existing and future requirements to support a nearly simultaneous two major theater war (MTW) scenario. This study was released on March 28<sup>th</sup> 1995 and validated the original MRS with some additional recommendations.

The additional recommendations included, shifting the surge sealift capacity of 280,000 square feet to the Army's Afloat Prepositioning Program, identifying the sealift required to position the Army War Reserve Package at sea to support the second Major Theater War (MTW) scenario, and continuously reviewing the strategic mobility requirements through the Joint Warfighter Capability Assessment (JWCA)/Joint Requirements Oversight Council (JROC) processes. All recommendations have been implemented.<sup>18</sup> Inserting strategic mobility oversight into the JROC/JWCA organizations was perhaps the most significant recommendation. By their nature these two organizations are ideally suited to prevent a recurrence of past failures. First, the JROC.

Title 10 U.S. Code - Armed Forces established the JROC and delineated its mission, composition, and reporting requirements.<sup>19</sup> The JROC identifies and assesses joint military requirements ensuring they meet the National Military Strategy, provides alternatives if necessary, and ensures the requirement conforms to the Defense Planning Guidance. Additionally, they oversee JWCA.<sup>20</sup>

The JWCA is the working group of JROC that directs assessment and examines reliability and interactions between joint warfighting capabilities i.e., interoperability. It identifies improvements in joint warfighter effectiveness. Various joint directorates sponsor them. Findings and recommendations are

forwarded to JROC and, if approved, for input to the Chairman Program Recommendations and the Chairman's Program Assessment.<sup>21</sup>

In aggregate, the MRS/MRS BURU addressed the most immediate sealift shortfalls. The LMSR procurement program is on schedule. Five ships have been delivered with the remaining fourteen scheduled for delivery through fiscal year 2001. Ninety-four dry cargo ships are presently in the inventory with a goal of 104 by fiscal year 1999. As previously discussed, the National Military Strategy of Shape, Respond, Prepare Now - A Military Strategy for a New Era, emphasizes the requirement to support two nearly simultaneous MTWs.<sup>22</sup> Even with all the aforementioned improvements in strategic sealift there is still a 550,000 square feet capacity shortfall.<sup>23</sup>

Some initiatives to meet this shortfall while minimizing risk are:

- (1) The expansion of available capacity on existing vessels.
- (2) The implementation of the Voluntary Intermodal Sealift Agreement (VISA) which will provide time-phased contingency access to commercial capacity through pre-negotiated agreements. As VADM Quast stated "the VISA program is based not on the number of ships but on their capacity . . . that is a major change."<sup>24</sup> With the decline in U.S. flag shipping there were concerns regarding mobilizing commercial shipping during a contingency regardless of impact on the commercial

industry; the capacity of the U.S. fleet has dropped by thirty-three percent.<sup>25</sup> VISA is the opportunity to add the capacity required for mobilization and will be a positive gain for the industry in peacetime.<sup>26</sup> Presently there are a total of ninety-seven ships enrolled in the program. Sixty-one of the ships are dry cargo vessels.<sup>27</sup>

(3) Another source of sealift incorporates military features into new and existing commercial ships for wartime commitments. The National Defense Feature (NDF) Program provides fifty million dollars to install militarily useful features on U.S. flagged, U.S. built vessels during construction or conversion. The shipping companies agree to make the ships available in time of national emergency. This program has been approved and funded.<sup>28</sup> The first contract was awarded to Hvide Van Ommeren Tankers for the installation and twenty-five years of maintenance for four refueling at sea stations on each of three commercial tankers presently under construction.<sup>29</sup>

(4) The prepositioning of surge requirements.

(a) Since Operation Desert Shield/Desert Storm, both the U.S. Army and U.S. Marine Corps have made significant strides in their respective prepositioning programs. "The Maritime Prepositioning Force concept remains a relevant

and proven capability that provides a cost-effective increase to U.S. crisis response capabilities. It is consistent with "Forward . . . From the Sea," and significantly increases responsiveness to contingencies and improves operational flexibility for combat, disaster relief, and humanitarian assistance operations."<sup>30</sup> The Marine Corps has three squadrons split among thirteen forward-deployed ships: one squadron in the Western Pacific, one in the Mediterranean, and one in the Indian Ocean.<sup>31</sup>

(b) The Navy's strategy "Forward from the Sea" also supports the Army sea-based preposition ships. The Army has become a CONUS-based force.<sup>32</sup> The Army has developed a comprehensive program of prepositioning, both ashore and afloat, in response to MRS. Afloat Prepositioning of a heavy combat brigade set of combat equipment with a full complement of combat service support and preposition of sustainment, supplies the contingency corps for thirty days. With the added sealift through the LMSR program, the Army will deploy a second brigade of equipment overseas.<sup>33</sup>

Since 1995, the Navy continues to monitor and aggressively pursue sealift modernization. In May 1997, the Quadrennial Defense Review revalidated the MRS and MRS BURU. The review

endorsed the baseline requirements for inter-theater mobility. QDR stated the requirements for ten million square feet of surge sealift comprised of FSS, RRF, and LMSRs and sea-based prepositioning totaling four million square feet.<sup>34</sup>

The LMSR shortfall has been addressed. The Department of the Navy's Fiscal Year 1998-1999 Biennial budget stated "A total of nineteen LMSRs are required to satisfy sealift requirements identified by the MRS. To date, contracts for the conversion of five LMSRs and construction of eleven more have been awarded. Two additional LMSRs will be procured FY98 and the program will be closed out in FY99 with the purchase of the final ship. These additions will increase our sealift capacity for delivering materials and equipment to the right place, at the right time and help the Navy achieve the MRS FY 2001 requirement."<sup>35</sup> By FY99, the Army will meet the requirements to support the Afloat Prepositioning Program and surge sealift, three million square feet and two million square feet, respectively.<sup>36</sup>

#### **RECOMMENDATIONS**

The Navy's sealift program is much more robust than eight years ago. Through the lessons learned from Operation Desert Shield/Desert Storm and the MRS and MRS BURU, the RRF has been upgraded with more RO/ROs and container vessels, SRP has been replaced by VISA, MARAD's funding has been increased to support

its mission, and commercial industry is a full-time partner with MSC through the VISA and NDF programs. The structures are in place to continuously evaluate the present and future sealift programs.

An area not addressed in any mobility requirements study was the projected availability of qualified civilian mariners. Harris and Stewart estimate a current shortfall of 3,152 civilian mariners.<sup>37</sup> This decline was caused by the decline in commercial shipping opportunities, lack of re-employment rights for reserves, and recent worldwide agreements on licensing and documentation. The Department of Defense, particularly TRANSCOM and MSC should ensure this issue is addressed in the next mobility requirements study and brought forward to the JWCA and JROC. Specifically, to ensure resources are apportioned for training and licensing requirements to adequately meet the requirements for the DOD civilian mariners and merchant marine reserves. Additionally, MARAD, USCG, and federal state and union maritime schools need to address the recent changes in licensing and training.

As stated earlier, even with the aforementioned programs a shortfall exists to meet the two MTW scenarios. TRANSCOM, as the lead agent for ensuring the Department Of Defense (DOD) meets force strategic mobility requirements, has the responsibility to evaluate programs and initiatives to meet this shortfall while minimizing operational risk.

TRANSCOM has taken some actions already to include planning for more prepositioning of equipment and expanding the cargo capacity on ships presently in the RRF. TRANSCOM, along with MSC, is working with commercial industry through programs like the Voluntary Intermodal Sealift Agreement and National Defense Features to expand the United States commercial sealift cargo capacity to meet the requirements of the QDR.

The next mobility requirements study will probably occur in 1999. DOD and TRANSCOM should begin evaluating the strategic mobility capabilities to meet the requirements of Joint Vision 2010. As stated in Joint vision 2010, DOD must be able to project the force at the decisive place and time and have the logistic systems, focused logistics, in place to be able to accomplish this mission.<sup>38</sup> Focused logistics is defined as "the fusion of information, logistics, and transportation technologies to provide rapid response, to track and shift assets even while enroute, and to deliver tailored logistics packages and sustainment directly at the strategic, operational and tactical level of operations."<sup>39</sup> This would allow material and equipment to get to the unit directly with the in-transit visibility for tracking and the resources to effectively command the system.<sup>40</sup>

While Operation Desert Shield/Desert Storm was successful, mainly because the Arabian Gulf had modern port capabilities, there were vulnerabilities. Some examples of these vulnerabilities include matching the unit with their equipment, ensuring the port logistics people were in country for offloading

and delivery prior to ship arrival, and lack of in-transit asset visibility. As in Somalia and Haiti, future operations could possibly be in third world countries with limited port and in-country transportation infrastructure along with the long transit time from "fort to port" hampering the mission.<sup>41</sup> The ships in the MSC inventory were and are limited in these environments.<sup>42</sup>

An idea to improve these capabilities was addressed by the Center for the Commercial Development of Transportation Technologies, chartered by TRANSCOM, who published a document titled "HIGH-SPEED SEALIFT/AGILE PORT OPERATIONAL CONCEPT DOCUMENT." This concept document discusses two programs: high-speed sealift and agile port capabilities. The two programs are further broken down into three specific areas to illustrate improvement: fast movement from Initial Staging Base, fast lift to theater and fast movement through the port.

The first idea is to use a high-speed ship (HSS), taking advantage of new technologies to improve ship speed to 40-50 knots for rapid delivery, and utilizing bow thrusters for better maneuverability in smaller ports. An inherent degree of defense is added with the speed and maneuverability of these vessels. Later generations of this vessel would replace the RO/RO's presently in the inventory and with an added capability to support not only transportation but also be adaptable for storage, medical, and evacuation and berthing. The second part of this concept is the agile port, which would utilize state of the art materiel and cargo handling technology, tagging, tracking

and information management systems. The agile port concept also recommends that DOD model the intermodal infrastructure at military ports similar to commercial shipping ports for improvements in the movement to and through the port. The combination of HSS and Agile Port (HSS/AP), along with state of the art C4I equipment, would improve the whole process from warning order to deployment and sustainment. The unit would be able to quickly prepare, process, and transit to the port and onload/offload, respectively.<sup>43</sup>

#### **CONCLUSION**

Adrift without the discipline of a process like JROC/JWCA, pre-Desert Shield/Desert Storm sealift program capabilities grew progressively detached from their customer's requirements. By time the 1990-1991 Gulf crisis emerged, strategic sealift could not possibly perform as advertised. MARAD presided over a poorly maintained fleet that was too old, too slow, too small, and that contained the wrong types of vessels. Judged against the ambitious standards set for it, the fleet could not hope to meet them.

There were bright spots. After initially failing to meet RRF activation rates, MARAD hired new contractors and eventually achieved a greater than ninety percent reliability rate of activation. All of the precious RO/RO vessels were activated on time. MSC, in keeping with the highest tradition of the Naval Service - flexibility, creatively used prepositioning ships for

missing surge lift. Smart people made the best of a deeply flawed system.

Change marks the intervening years. Three major studies focused on logistics and made sound recommendations. These were acted upon or funded as necessary. The fleet has been modernized, better maintained, and shaped to meet current force projection requirements. LMSRs are replacing Victory ships; RO/RO vessels are replacing old break bulk ships. Most importantly, there now exists a strong imbedded structure to ensure strategic sealift programs remain relevant to their customer forces, adequately funded, and consistent with joint force requirements.

DOD is addressing current structural problems in a systematic manner, but some future issues demand current action. The mariner shortage requires a two-pronged effort. Defense needs to immediately implement those solutions over which it has control, such as reservist training; and, lead a multi-agency effort to persuade Congress to fund those programs resident in other agencies. The HSS/AP concept has been studied. It is time to introduce it into the JROC/JWCA process so funding and procurement can begin; Agile Port hardware is already commercially available off-the-shelf, but the High Speed Ships will require relatively longer development times and larger funding. By addressing these issues today, DOD will ensure it has the wherewithal to meet the conflicts of tomorrow.

Word Count: 4,079



## ENDNOTES

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<sup>3</sup> Ibid., 124.

<sup>4</sup> Ibid., 122.

<sup>5</sup> Ibid., 129.

<sup>6</sup> Lt.General William G. Pagonis with Jeffery L. Cruikshank, Moving Mountains: Lessons in Leadership and Logistics from the Gulf War (Harvard Business School Press, 1992), 203.

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<sup>8</sup> Ibid., 128.

<sup>9</sup> Lawrence Schwartz et al., Review of DOD's Strategic Mobility Programs Commercial Sealift Support (Logistics Management Institute, 1992), iii.

<sup>10</sup> Lee Smith, "Lessons Learned from the Gulf", Fortune, 28 January 1991, 88.

<sup>11</sup> Matthews, 116.

<sup>12</sup> Ibid., 116.

<sup>13</sup> Schwartz, 18.

<sup>14</sup> Matthews, 129.

<sup>15</sup> Ibid., 129.

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<sup>17</sup> Matthews, 130.

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<sup>20</sup> Office of the Chairman of the Joint Chiefs of Staff, Charter of the Joint Requirements Oversight Council, CJCS Instruction 5123.01 (Washington D.C.: 2 May 1997), 3.

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<sup>31</sup> General Accounting Office, Strategic Mobility: Serious Problems Remain in U.S. Deployment Capabilities (Washington, D.C.: U.S. General Accounting Office, April 1994), 3.

<sup>32</sup> Prina, 8.

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<sup>35</sup> Department of the Navy Homepage FY 99 Department of the Navy Budget; available from <<http://www.navy.mil>>. Internet; accessed 6 February 1998.

<sup>36</sup> Military Sealift Command, Defense Transportation Journal (February 1997), 23.

<sup>37</sup> David Harris and Richard Stewart, "US Surge Sealift Capabilities: A Question of Sufficiency", Parameters, Vol 28 (Spring 1998), 71.

<sup>38</sup> Chairman of the Joint Chiefs of Staff John M. Shalikashvili, General, USA, JOINT VISION 2010, (Washington D.C.: Joint Chiefs of Staff), 24.

<sup>39</sup> Ibid.

<sup>40</sup> Director for Logistics John J. Cusick, LTG, USA and Chairman of the Joint Chiefs of Staff John M. Shalikashvili, General, USA, Focused Logistics Roadmap, (Washington D.C.: Joint Chiefs of Staff 1997), i.

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<sup>43</sup> Hughes, 15-17.



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